Abstract: A package for a cable reel (30), comprising bearing means allowing withdrawal from the package of a cable (40) wound between a pair of opposite flanges (32) on the reel such that the reel rotates in the package. To provide a package which puts no higher demands on the strength of the package material and which in a simple manner is capable of rotatably supporting a fully wound cable reel, the bearing means comprise a slide guide (50) provided for a peripheral area of each reel flange (32) in the package (10).
Cable reel package

TECHNICAL AREA

The invention relates to a package for a cable reel, comprising bearing means allowing withdrawal from the package of a cable wound between a pair of opposite flanges on the reel such that the reel rotates in the package.

BACKGROUND

A cable for installation purposes is often supplied in the shape of a coiled length enclosed in a package comprising a plastic film shrunk pack. When installing the cable, the cable is withdrawn from the package in an uncoiling manner that inevitably will twist or "spiralize" the cable and make the cable difficult to handle. Multiple conductor cables and particularly cables having an inner aluminum foil can be especially difficult to handle on these occasions. To avoid these problems it is known in the prior art, for example US-A-3,693,784, to supply the cable wound onto a reel or bobbin having a hub that is rotatably journalled in a package in such a manner that the cable may be unwound by rotation of the reel in the package. Such a rotationally supporting package must have a relatively high strength to freely rotatably support a bobbin including a fully wound cable. It can also be relatively difficult to insert the bobbin into the package. If as usual, one would like to insert the bobbin into an opening of a box-shaped package, the package must have a relatively complicated arrangement for providing the journal support for the hub of the bobbin.

DISCLOSURE OF THE INVENTION

An object of the present invention is to provide a package of the kind defined above, which puts low demands on the strength of the package material and which is capable in a simple manner of rotatably supporting a fully wound cable reel.

This object is obtained by the features defined in the appended claims.

According to an aspect of the invention, the rotational support means comprise a slide guide provided in the package for a peripheral portion of each reel flange. In this manner, by the
cable reel being exteriorly supported, the rotational support means will form an insert in the
package that supports the cable reel and is supported by the bottom of the package. Such a
rotationally supporting package puts no extra requirements on the package casing as com-
pared to a regular transport package. The package will therefore be substantially easier and
cheaper to produce than a hub-journalling package according to the prior art.

If, according to an embodiment of the invention, the slide guide is provided with both a radial
and an axial supporting function, the cable reel can be rotated in the package even when the
reel is lying on its side in the package.

Other features and advantages of the invention are apparent from the following detailed de-
scription and from the claims.

DETAILED DESCRIPTION OF THE DRAWING

FIG. 1 is a lateral view with parts broken away of a package according to the invention;

FIG. 2 is a view approximately along line 2-2 of a package according to FIG. 1;

FIG. 3 is a view obliquely from above with parts broken away of a lying package having no
cable and an enlarged area thereof to illustrate principles of the invention;

FIG. 4 diagrammatically shows an embodiment of a slide guide according to the invention;

FIGS. 5A-5D are diagrammatical views of four additional embodiments of slide guides for a
package according to the invention; and

FIG. 6A-6C diagrammatically show a way of completing a package according to FIGS. 1-3.

DETAILED DESCRIPTION OF EMBODIMENTS

On the drawing, a package for a cable reel 30 is generally designated by 10.

The cable reel 30, which usually also may be referred to as a bobbin or a cable drum, com-
prises a pair of spaced opposite reel ends or lateral flanges 32 which are joined by a hub 34.
In the embodiment shown in FIG. 3, each flange 32 is produced in the shape of a lattice or framework structure to save material. The framework structure may have radial spokes 37 between the hub and an outer annular ring 38 of the flange 32. The reel flanges 32 may also be fully covering as is indicated in FIG. 1.

A cable 40 is wound on the cable reel 30 and, in the example shown, comprises a single conductor 42 having a sheath 44. The cable can also, however, be a multiple conductor cable, for example a power cable of the EKRK type having 2-5 conductors and an inner aluminium casing. Other types of cables may be opto cables and telephone cables.

The package 10 comprises a parallelepipedic package box 12 (FIG. 1) that can be produced from corrugated fiberboard or cardboard, for example. Box 12 may have an opening 20 for taking out the cable, an opening 22 for a user, for example, to be able to rotate the cable reel backwards in the package by his/her fingers, and may also have a carrying handle 24.

According to the invention, a slide guide 50 is provided inside the package. The slide guide 50 allows the cable reel 30 to rotate freely within the box 12. More precisely, the slide guide 50 is adapted to rotationally support the cable reel 30 between a peripheral area of the reel flanges 32 and the adjacent inside faces 14, 16, 18 of the package box 12. As desired and depending on embodiment, the slide guide 50 may be provided at a single face or at a few or all four inside faces of the box 12. In the exemplary embodiments shown, the slide guide 50 extends along three inside faces, i.e. a pair of opposite vertical inside faces 16, 16 and a bottom inside face 18 (FIG. 1).

The slide guide 50 is, however, adapted to rotationally support the cable reel 30, not only in a standing position as shown in FIG. 1 and 2 but also in a lying position shown in FIG. 3. Accordingly, in addition to the radially supporting function, the slide guide 50 also has an axially supporting function.

In the embodiment shown on FIG. 1-3, the slide guide 50 is provided on a flexible band or strip 58 for each reel flange 32. In this case and as is specifically apparent from FIG. 2, the slide guide 50 is shaped as a smoothly rounded groove that can be considered as having a bottom 56 and a pair of opposite lateral walls 52, 54. The band including the groove is formed for example by extrusion of a suitable plastics material having a low friction, such as HDPE, but also other plastics materials may be suitable, integrally formed with a pair of flat, interconnected bottom flanges 60, 62. A lubricant may also be applied between the contacting surfaces of the slide guide 50 and the peripheral area of the reel flanges 32.
In this case, the bottom flange 62 (FIG. 2) directed towards the adjacent inner face 14 of the package box 12, serves as a spacing means between the slide guide 50 and said inner face 14, resulting in that the reel flange 32 is prevented from coming into contact with the inner face 14. The two bands 58 can also be interconnected by a web 64 indicated in phantom in FIG. 2, for example a lattice structure (not shown). Of course, it is conceivable to use also other means, such as an adhesive, to keep the slide guide in place in the package box 12.

In order that the reel flanges 32 should not move out of the slide guides 50 when the box 12 is lying on its side, the guides 50 may not be too shallow, or the radial play of the reel flanges 32 in the guides 50 may not be too large.

In addition to the flexibility and elasticity that make the band 58 capable of enclosing the outer periphery of the reel flanges 32, it is also, from manufacturing purposes, desirable that the band 58 is so flexible that it can be supplied from a reel. The lateral walls 52, 54 (FIG. 1) of the guide 50 must therefore not be so stiff or inelastic that they cannot be shaped to a desired height without the danger of deforming the band by wrinkling or the like. If the lateral walls 52, 54 -- for example due to the weight of the cable reel 30 -- need be so stiff that it will be difficult to bend the band 58 in a desired way, the lateral walls of the band 58 can be provided, for example, with transverse V-shaped recesses 53 in the manner indicated in FIG. 2. By appropriate dimensioning and distribution of such recesses 53, the band material may be allowed to have more bending stiffness without impeding the desired bending of the band around the reel flanges 32 or around a storage bobbin (not shown). Instead of or as a supplement to V-shaped recesses in the top portion of the band 58, it is also possible to provide transverse slots 51 across the bottom part of the band 58.

According to an alternative embodiment the slide guide 50 does not need to extend in a curved manner along the reel flanges 32 but can, as indicated in FIGS. 4 and 5, be formed as a planar guide, which instead follows the planar inner faces 16, 18 of the package box 12. In this case the guide 50, as shown in FIG. 4, can be formed locally in the middle of the respective inner faces 16, 18. The slide guide 50 may be formed, for example by blow molding, onto an insert 66 having the shape of a sheet. The insert 66 can be foldable to the shape of an "L", "U" or "O" to fully or partly extend along the inner faces of the package box 12. The insert needs not to extend fully across the box but may, as is indicated by the phantom line in FIG. 4, have a width that approximately corresponds the width of the band 58 previously described. It is, however, also conceivable to allow the insert 66 to extend in a curved manner along the reel flanges 32, like the band 58, and the insert can also be provided with local
slide guides 50 along the length thereof (not shown). Such an insert could also be supplied wounded onto a reel.

The insert of FIG. 4 may also be divided into separate pieces that are only so large that they are precisely capable to support the slide guides 50 (not shown). In this case, however, each slide guide needs to be separately secured to the corresponding inner face 16, 18, for example by staples or a suitable adhesive.

Four examples of embodiments of cross sections of the slide guide 50 are shown in FIGS. 5A-D. In order that the reel flanges should not wear on the material of the walls of the box 12, preferably the guide 50 has always at least one lateral support 52 and a bottom support 56, at least if the walls are made from relatively wear-sensitive corrugated fiberboard material.

If according to FIG. 5A, the peripheral rim 38 of the reel flange 32 has a lateral flange 39, the lateral flange 39 can serve as a spacer and provide for that any other part of the reel flange will not engage the adjacent inner face 14 of the box 12 by any braking action. In this case, the slide guide 50 has its most simple shape, i.e. having only one outer lateral support 52 and one bottom support 56. If the reel flange 32 is of a standard type, i.e. without any sufficiently far extending lateral flange 39 of the peripheral rim or ring 38, the guide 50 will be secured in a transverse direction of the package box 12, either by spacing means 53 (FIG. 5B, C) acting against the adjacent inner face 14 of the box 12, or by a securing means 55 (FIG. 5D) such as staples or any other binding agent acting on the supporting inner face of the box 12. In the latter case it may be sufficient if each reel flange 32 has only one inner lateral support 54.

FIGS. 6A-C diagrammatically show a method of producing a package according to the invention.

An empty package box 12 having an opened top is placed on a supporting surface. A pair of bands 58 provided with slide guides according to the invention are placed on top of the opened box 12. The bands 58 are pushed forward on diagrammatically shown supports from a storage roll and thereafter cut to a desired length. The supports are suitably shaped as grooves or channels (not shown) in order that the bands 58 may not diverge in a lateral direction.

A reel 30 fully wound with cable 40 is lowered from above into the opened box 12. When the cable reel 30 enters into the box 12, the reel flanges 32 engage 32 the top face of the re-
spective band 58. During the continued lowering of the cable reel 30, the elastic bands 58 are curved around the peripheral portions of the reel flanges 32, supported by the opposite upper lateral edges of the box 12.

The bands 58 follow the cable reel 30 down into the bottom of the box 12 and enclose the reel flanges in a U-shaped fashion between the opposite inner faces of the box 12. The box 12 is thereafter brought aside and closed so that a new box 12 can be placed below a new cable reel 30 and the bands 58 from the storage roll can be pushed forward over the box opening and cut to the desired length, whereafter the following package can be produced in the same manner as the previous package.
CLAIMS

1. A package for a cable reel (30), comprising bearing means allowing withdrawal from the package of a cable (40) wound between a pair of opposite flanges (32) on the reel such that the reel rotates in the package, characterized in that said bearing means comprise a slide guide (50) provided for a peripheral area of each reel flange (32) in the package (10).

2. The package according to claim 1, wherein the slide guide (50) is provided with a radial as well as an axial supporting function.

3. The package according to claims 1 or 2, wherein the slide guide (50) is adapted to extend at least partially along a periphery of the reel flange (32).

4. The package according to claims 1 or 2, wherein the slide guide (50) is adapted to extend at least partially along inner faces (16, 16, 18) of the package (12).

5. The package according to any of the previous claims, wherein the slide guide (50) is provided on a band (58).

6. The package according to any of the previous claims, wherein the slide guide (50) is provided on a sheet (64).

7. The package according to claim 6, wherein the sheet (66) is an insert having a general L-shape.

8. The package according to claim 6, wherein the sheet (66) is an insert having a general U-shape.

9. The package according to any of the previous claims, wherein the slide guide (50) comprises a lateral support (52, 54) for a periphery of the reel flange (32).

10. The package according to any of the previous claims, wherein the slide guide (50) comprises a groove (52, 54, 56) for a periphery of the reel flange (32).
11. The package according to any of the previous claims, comprising means (62, 39, 63) adapted to keep the reel flange (32) spaced from an adjacent parallel inner face (14) of the package (12).

12. The package according to claim 9, wherein said means comprise spacing means (62, 53) between the reel flange (32) and said parallel inner face (14) of the package (12).

13. The package according to claim 9, wherein said means comprise means (55) for securing the slide guide to an adjacent supporting inner face (16, 18) of the package.
## A. CLASSIFICATION OF SUBJECT MATTER

B65D85/04

According to International Patent Classification (IPC) or to both national classification and IPC.

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched.

## EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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**Further documents are listed in the continuation of box C.**

**Patent family members are listed in annex.**

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